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Analysis Report

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ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Integral Consulting Inc.
Suite 190
285 Century Place
Louisville CO 80027

Report Date: October 03, 2016

Project: Solvay

Submittal Date: 09/21/2016
Group Number: 1711970
State of Sample Origin: NJ

Client Sample Description	Lancaster Labs (LL) #
V-915 (G-Trizma) Grab Water	8604332
Field Blank (G- Trizma) Grab Water	8604333

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Integral Consulting Inc.	Attn: Erin Palko
Electronic Copy To	Integral Consulting Inc.	Attn: Craig Hutchings

Respectfully Submitted,

Stacy L. Hess
Project Manager

(717) 556-7236

Sample Description: V-915 (G-Trizma) Grab Water

Project Name: Solvay

LL Sample # WW 8604332
LL Group # 1711970
Account # 20003

Collected: 09/19/2016 15:30

Submitted: 09/21/2016 09:30
Reported: 10/03/2016 15:47

Integral Consulting Inc.
Suite 190
285 Century Place
Louisville CO 80027

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**		**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	340		10	20	10
10954	Perfluorononanoic acid	375-95-1	2,700		100	200	100
10954	Perfluorodecanoic acid	335-76-2	34		1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	94		2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.		3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.		2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.		3	5	1
10954	Perfluorohexanoic acid	307-24-4	18	J	10	20	10
10954	Perfluoroheptanoic acid	375-85-9	51		1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.		4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.		4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.		50	100	10

Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	16271010	09/30/2016 00:34	Jason W Knight	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	16271010	09/30/2016 11:13	Jason W Knight	10
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	16271010	09/30/2016 11:25	Jason W Knight	100
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16271010	09/27/2016 13:10	Alex L Barton	1

*=This limit was used in the evaluation of the final result

Sample Description: Field Blank (G- Trizma) Grab Water

Project Name: Solvay

LL Sample # WW 8604333
LL Group # 1711970
Account # 20003

Collected: 09/19/2016 15:30

Submitted: 09/21/2016 09:30
Reported: 10/03/2016 15:47

Integral Consulting Inc.
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285 Century Place
Louisville CO 80027

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit*	Limit of Quantitation	Dilution Factor
Misc. Organics	**EPA 537 Rev. 1.1 modified**		**ng/l**	**ng/l**	**ng/l**	
10954	Perfluorooctanoic acid	335-67-1	N.D.	1	2	1
10954	Perfluorononanoic acid	375-95-1	N.D.	1	2	1
10954	Perfluorodecanoic acid	335-76-2	N.D.	1	2	1
10954	Perfluoroundecanoic acid	2058-94-8	N.D.	2	4	1
10954	Perfluorododecanoic acid	307-55-1	N.D.	3	5	1
10954	Perfluorotridecanoic acid	72629-94-8	N.D.	2	4	1
10954	Perfluorotetradecanoic acid	376-06-7	N.D.	3	5	1
10954	Perfluorohexanoic acid	307-24-4	N.D.	1	2	1
10954	Perfluoroheptanoic acid	375-85-9	N.D.	1	2	1
10954	Perfluorobutanesulfonate	375-73-5	N.D.	4	10	1
10954	Perfluorohexanesulfonate	355-46-4	N.D.	4	10	1
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	1

Sample Comments

State of New Jersey Lab Certification No. PA011

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	16271010	09/30/2016 00:22	Jason W Knight	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16271010	09/27/2016 13:10	Alex L Barton	1

*=This limit was used in the evaluation of the final result

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Quality Control Summary

Client Name: Integral Consulting Inc. Group Number: 1711970
Reported: 10/03/2016 15:47

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ng/l	MDL** ng/l	LOQ ng/l
Batch number: 16271010	Sample number(s): 8604332-8604333		
Perfluorooctanoic acid	N.D.	1	2
Perfluorononanoic acid	N.D.	1	2
Perfluorodecanoic acid	N.D.	1	2
Perfluoroundecanoic acid	N.D.	2	4
Perfluorododecanoic acid	N.D.	3	5
Perfluorotridecanoic acid	N.D.	2	4
Perfluorotetradecanoic acid	N.D.	3	5
Perfluorohexanoic acid	N.D.	1	2
Perfluoroheptanoic acid	N.D.	1	2
Perfluorobutanesulfonate	N.D.	4	10
Perfluorohexanesulfonate	N.D.	4	10
Perfluoro-octanesulfonate	N.D.	5	10

LCS/LCSD

Analysis Name	LCS Spike Added ng/l	LCS Conc ng/l	LCSD Spike Added ng/l	LCSD Conc ng/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 16271010	Sample number(s): 8604332-8604333								
Perfluorooctanoic acid	200	220.04	200	213.29	110	107	70-130	3	30
Perfluorononanoic acid	200	184.87	200	192.07	92	96	70-130	4	30
Perfluorodecanoic acid	200	222.7	200	188.03	111	94	70-130	17	30
Perfluoroundecanoic acid	200	173.82	200	178.72	87	89	70-130	3	30
Perfluorododecanoic acid	200	210.34	200	218.91	105	109	70-130	4	30
Perfluorotridecanoic acid	200	209.45	200	221.12	105	111	70-130	5	30
Perfluorotetradecanoic acid	200	205.25	200	206.87	103	103	70-130	1	30
Perfluorohexanoic acid	200	229.14	200	207.58	115	104	70-130	10	30
Perfluoroheptanoic acid	200	164.44	200	172.92	82	86	70-130	5	30
Perfluorobutanesulfonate	176.8	171.97	176.8	145.38	97	82	70-130	17	30
Perfluorohexanesulfonate	189.2	207.38	189.2	181.28	110	96	70-130	13	30
Perfluoro-octanesulfonate	191.2	183.73	191.2	207.94	96	109	70-130	12	30

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Integral Consulting Inc. Group Number: 1711970
Reported: 10/03/2016 15:47

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ng/l	MS Spike Added ng/l	MS Conc ng/l	MSD Spike Added ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 16271010	Sample number(s): 8604332-8604333 UNSPK: 8604332									
Perfluorooctanoic acid	343.04	200	928.24			293*		70-130		
Perfluorononanoic acid	2743.06	200	4753.12			1005 (2)		70-130		
Perfluorodecanoic acid	34.29	200	248.58			107		70-130		
Perfluoroundecanoic acid	94.1	200	273.14			90		70-130		
Perfluorododecanoic acid	N.D.	200	214.59			107		70-130		
Perfluorotridecanoic acid	N.D.	200	214.37			107		70-130		
Perfluorotetradecanoic acid	N.D.	200	192.24			96		70-130		
Perfluorohexanoic acid	18.11	200	242.84			112		70-130		
Perfluoroheptanoic acid	50.78	200	222.29			86		70-130		
Perfluorobutanesulfonate	N.D.	176.8	177.61			100		70-130		
Perfluorohexanesulfonate	N.D.	189.2	207.33			110		70-130		
Perfluoro-octanesulfonate	N.D.	191.2	171.96			90		70-130		

*- Outside of specification
**-This limit was used in the evaluation of the final result for the blank
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody

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For Eurofins Lancaster Laboratories Environmental use only

Acct. # 20003 Group # 1711970 Sample # 8604332-33

COC # 510380

Client Information

Client: Solvay	Acct. #:
Project Name/#:	PWSID #:
Project Manager:	P.O. #:
Sampler: Christensen	Quote #:
State where samples were collected: NJ	For Compliance: Yes ☒ No ☐

Matrix: Tissue ☐ Sediment ☐ Soil ☐; Water: Potable ☐ NPDES ☐ Ground ☐ Surface ☒; Other: ____

Analysis Requested — Preservation Codes: O

For Lab Use Only
FSC: ____
SCR#: 194485

Preservation Codes
H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks
O=Trizma

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Water	Other	Total # of Containers	PFAA
V-915 (G; Trizma)	9/19/16	1530	X					2	X
Field Blank (G; Trizma)	9/19/16	1530	X					1	X

Turnaround Time (TAT) Requested (please circle)
Standard (circled) Rush
(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: ____

E-mail address: ____

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	9/19/16	1630	[signature]	9/20/16	0800
[signature]	9/20/16	1500			
			[signature]	9/20/16	930

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)
Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13
NYSDEC Category A or B | MA MCP | CT RCP

EDD Required? Yes No (circled)
If yes, format: ____

Site-Specific QC (MS/MSD/Dup)? Yes No
(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier: 9/21/16 8AM
UPS ____ FedEx X Other ____

Temperature upon receipt 5.3 °C

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The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

7044 0216

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Sample Administration Receipt Documentation Log

Doc Log ID: 162778

Group Number(s): 1711970

Client: Integral Consulting Inc

Delivery and Receipt Information

Delivery Method:	Fed Ex	Arrival Timestamp:	09/21/2016 9:30
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	NJ		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Ayesha Ahmad (10877) at 13:10 on 09/21/2016

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	5.3	DT	Wet	N	Bagged	N

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Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	**BMQL**	Below Minimum Quantitation Level
N.D.	none detected	**MPN**	Most Probable Number
TNTC	Too Numerous To Count	**CP Units**	cobalt-chloroplatinate units
IU	International Units	**NTU**	nephelometric turbidity units
umhos/cm	micromhos/cm	**ng**	nanogram(s)
C	degrees Celsius	**F**	degrees Fahrenheit
meq	milliequivalents	**lb.**	pound(s)
g	gram(s)	**kg**	kilogram(s)
µg	microgram(s)	**mg**	milligram(s)
mL	milliliter(s)	**L**	liter(s)
m3	cubic meter(s)	**µL**	microliter(s)
		pg/L	picogram/liter

<	less than
>	greater than
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.
ppb	parts per billion
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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